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# A CLARIFICATION OF THE FLIGHT PERIODS OF SEVERAL SIBLING SPECIES OF MOTHS IN OHIO AS INDICATED BY LIGHT TRAPS

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Light trapping has been and will remain a good method of determining the flight activity, relative abundance, and seasonal fluctuations for many species of insects. Banerjee (1967) used light traps to determine the periods of activity for several species of crambid moths. Selman and Barton (1972) utilized light traps in Arkansas to study the seasonal trends and relative abundance of 12 species of Lepidoptera. The United States Department of Agriculture is constantly monitoring insect population fluctuations by means of light traps, and it is from their traps at Wooster, Ohio that data for this paper were collected.

Each species of moth discussed herein has one or more sibling species associated with it in Ohio and this has caused records for them to be confused in the past. The purpose of this paper is twofold: first, to clarify the seasonal activity of these species; and, second, to report the occurrence of some of these species in Ohio where there are no published records for them. When he stated that it was almost impossible to sift out records for the (*Apantesis*) *nais* complex in Florida, Kimball (1965) echoed my feelings that it would be almost impossible to sort out Ohio records for all of the species presented in this paper.

The graphs (Figs. 1-4) present the weekly catches for each species of moth. The dates correspond to the last day of that week. These curves are presumed to indicate the flight periods and relative abundance to some extent. By plotting weekly catches, some short-term variations in trap counts caused by weather variables should have been overcome.

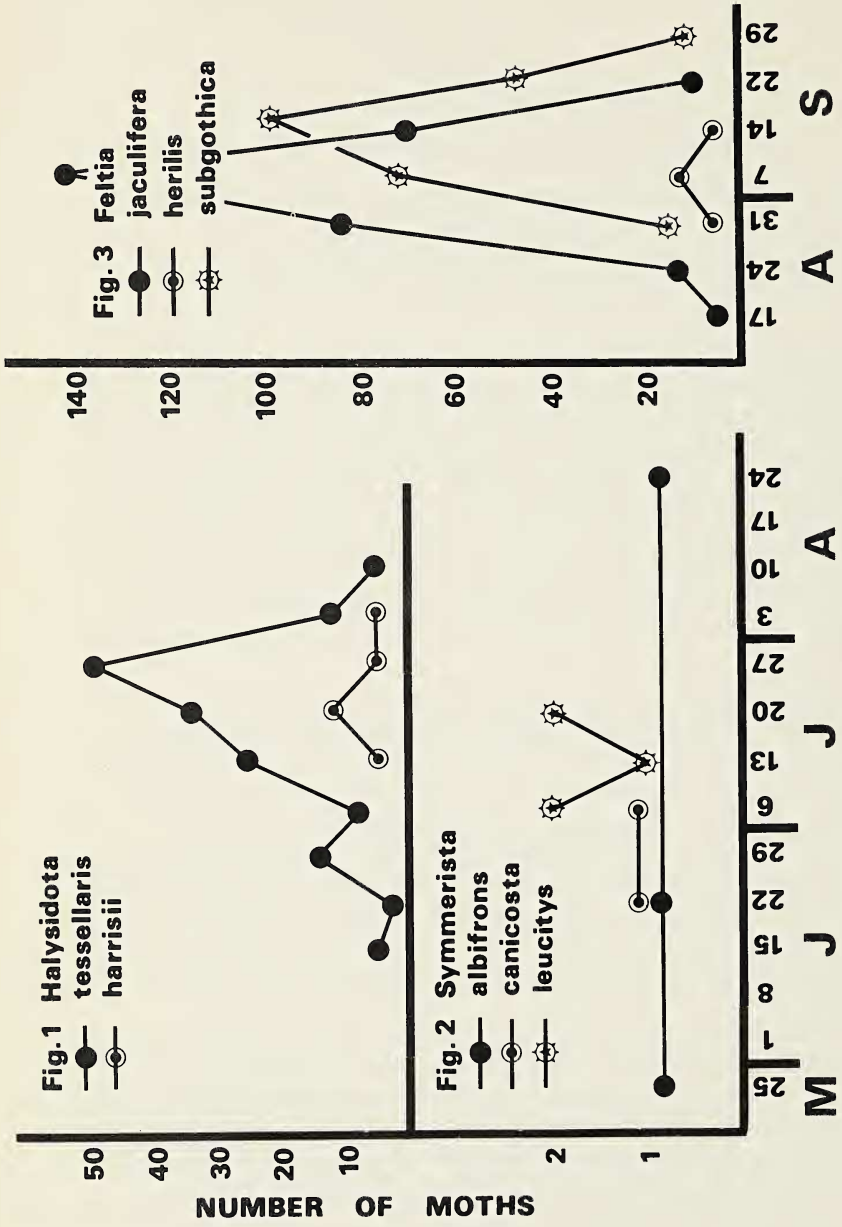
Fig. 1 Halysidota
tessellaris
harrisii
Fig. 2 Symmerista
albifrons
canicosta
leucitys
Fig. 3 Feltia
jaculifera
herilis
subgothica
NUMBER OF MOTHS
TRAP INTERVAL ENDING
M J J A S
25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 22 29
50 40 30 20 10
2 1
140 120 100 80 60 40 20

## METHODS AND MATERIALS

Three blacklight traps of the type recommended by the Entomological Society of America for general insect surveys (Anonymous, 1966) were used in this study. One trap with a 15-w fluorescent blacklight lamp was located in an open, wooded area at the Ohio Agricultural Research and Development Center about one mile southeast from the center of Wooster, Ohio; another with a 15-w lamp was located in a residential area about two miles northwest of Wooster; and, the third, with a 60-w blacklight lamp, was in the center of a field crop area (planted in corn, soybeans, strawberries, and sorghum and bordered by wild cherry, apple, plum and peach trees) on route 250 about two miles east of the Ohio Agricultural Research and Development Center at Wooster. The collecting containers were emptied daily, a preliminary check was made for economically important species, and the moths were placed in 70% ethyl alcohol until they could be examined. The traps were operated throughout 1972.

The male genitalia of every moth presented herein was examined to ascertain its speeific identity. Some species (e.g. *Apantesis* spp.) could be recognized without dissection of the genitalia by simply removing the scales from the caudal end and examining the apical proeesses of the valvae. Others (e.g. *Symmerista* spp.) had to be macerated in KOH and dissected before their specific status could be ascertained. Female genitalia were not examined.

## RESULTS AND DISCUSSION

*Halysidota tessellaris* Abbot and Smith and *H. harrisii* Walsh. —Until reeently there had been much confusion on the status of these two species. Tietz (1952) believed that *harrisii* was simply a variety of *tessellaris*. His records for *tessellaris* in Pennsylvania are surely a mixture of both species because Tietz recognized that there was a slight morphological difference between the larvae of *tessellaris* and *harrisii*, and had collected both types.

Interestingly, Walsh (1864) described *harrisii* as a form of *tessellaris* on the basis of the difference in the larvae, but could find no difference in the imago stage of the two. Grote (1882) also believed *harrisii* to be a dimorphic larval variety of *tessellaris*. Nine years later Dyar (1891) stated why he believed them to be separate species. Thus the confusion continued

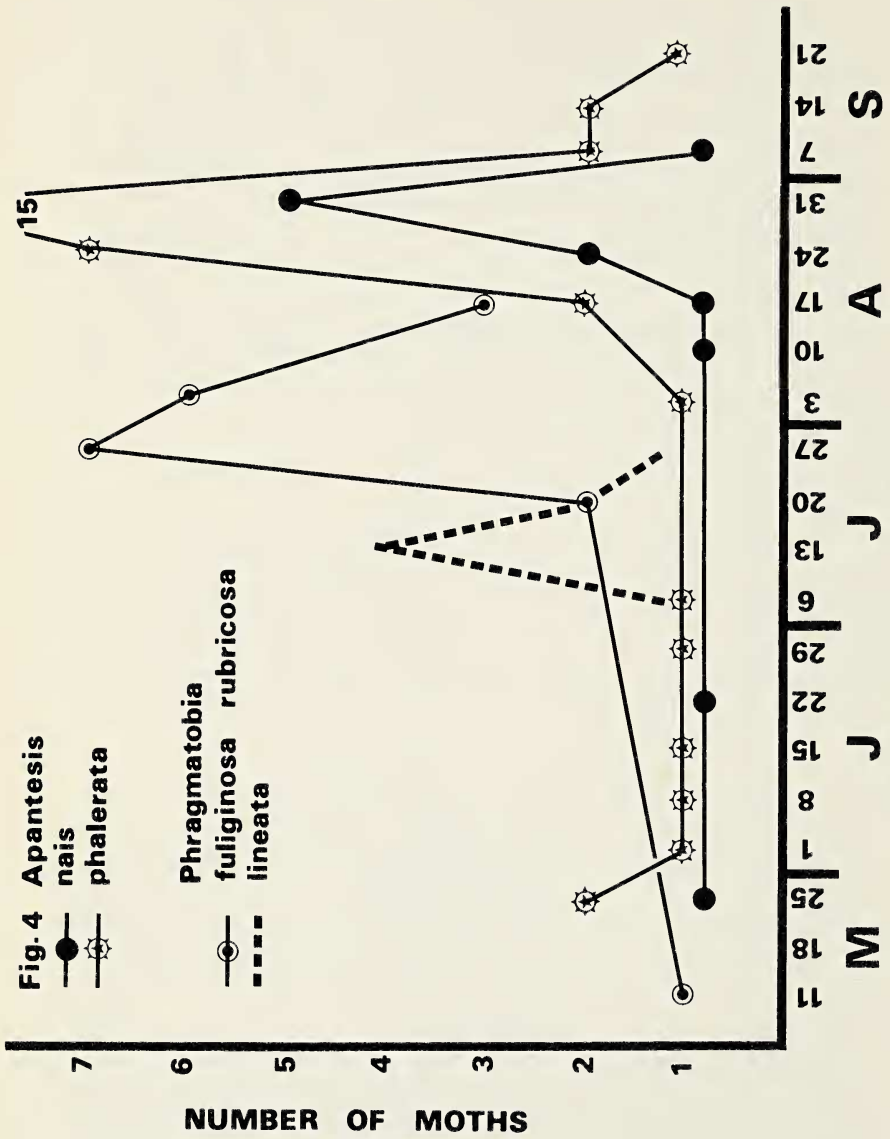
Fig. 4 Apantesis
nais
phalerata
Phragmatobia
fuliginosa rubricosa
lineata
15
NUMBER OF MOTHS
7
6
5
4
3
2
1
11 18 25 1 8 15 22 29 6 13 20 27 3 10 17 24 31 7 14 21
M J J A S
TRAP INTERVAL ENDING

until Forbes (1960) described distinct morphological differences in the imago and concluded them to be distinct species.

*H. tessellaris* was first caught during the week ending June 15 (Fig. 1). Their numbers steadily increased until July 27 and then there was a sharp decline until the last specimen was taken on Aug. 10. *H. harrisii* was not as numerous as *tessellaris.* It was not until July 13 that the first specimens appeared at the trap (Fig. 1). The following week *harrisii* reached its peak activity. No more *harrisii* were trapped after Aug. 3. This is the first published record of *harrisii* for Ohio; however, *tessellaris* has been collected in Seneca (Henninger, 1910), Montgomery (Pilate, 1882), and Pickaway (Bales, 1909) Counties, Ohio.

*Apantesis nais* (Drury) and *A. phalerata* (Harris).—There have been a number of names given to these two species. As late as 1952, Tietz, working in Pennsylvania, considered *A. vittata* and *A. radians* as distinct species, but it is now known they are synonyms of either *nais* or *phalerata.* He did state that these species were highly variable and that they could be color varieties of a few species. Bales (1909), in his list of Lepidoptera taken at Pickaway County, Ohio, recorded only *A. vittata;* therefore, it is not known whether he collected *nais* or *phalerata.* Similarly, other Ohio records for this complex are confused.

The first specimens of *A. nais* and *phalerata* were taken during the week ending May 25 (Fig. 4). Only a few specimens of each species were trapped until August, with both species having peak flights on Aug. 31. The last *phalerata* was taken on Sept. 7, whereas the last *nais* was trapped Sept. 21.

*Phragmatobia fuliginosa rubricosa* (Harris) and *P. lineata* Newman and Donahue.—Until Donahue and Newman (1966) described *P. lineata* as a new species, records for it were intermixed with either *rubricosa* or *P. assimilans.* Obviously Tietz (1952) recognized only one species, *rubricosa;* however, his records probably include a mixture of both *lineata* and *rubricosa* since both are now known to occur in Pennsylvania.

During the week of May 11, the first *P. rubricosa* was trapped (Fig. 4) but then no more were taken until July 20. Flight activity was at its peak on July 27, after which their numbers began to decline until the last specimens were taken on Aug. 17. This is the first published record of *rubricosa* for Ohio. Donahue and Newman (1966) did not report the distribution of *rubricosa* as including Ohio; however, they stated that it probably occurs here. Since they include many records for this species in adjacent states, *rubricosa* will probably be found to be more common when more extensive light trapping is done in Ohio.

*P. lineata* was found to be less common than *rubricosa.* The first specimen was caught during the week of July 6, and the last one appeared on July 27, with activity at its greatest during the second week of July (Fig. 4). It should be noted that one might expect to collect *lineata* later into the year, since the one Ohio record of this species was taken on Sept. 8 (Donahue and Newman, 1966).

*Symmerista albifrons* (Abbott and Smith), *S. canicosta* Franclemont, and *S. leucitys* Franclemont.—Until Franclemont (1946) resolved this complex, *canicosta* and *leucitys* were misidentified as *albifrons. S. albifrons* has reportedly been taken in Ohio on numerous occasions; however, the following data constitutes the first published record of *canicosta* and *leucitys.*

Although there were only a few specimens of these three species trapped, their flight activities concur with Franclemont's (in Forbes, 1948) findings. He stated that *albifrons* is active during May to June and in August for New York and neighboring states. The graph (Fig. 2) indicates this to be the case for Ohio; however, only one specimen was taken in May, one in June, and one in August. Further, Franclemont says that *canicosta* flies during June and July. The two specimens of *canicosta* reported herein were taken during the weeks ending June 22 and July 6 (Fig. 2).

More specimens of *leucitys* were taken than either of the other species of *Symmerista,* and they were all taken in July (Fig. 2). Franclemont reported *leucitys'* flight activity as mid-June to July (in Forbes, 1948).

*Feltia subgothica* Haworth, *F. herilis* Grote, and *F. jaculifera* Guenee.—Past records for this complex also need further verification. Tietz' (1952) records for Pennsylvania did not include *herilis,* and he seems to have used the name *ducens* for *subgothica* and *subgothica* for *jaculifera.* Interestingly, Turner (1920), in his light trapping study of Maryland Lepidoptera, must have realized the uncertainty of this group as his Table I lists 57 separate species, but simply reported all of his 411 specimens of this group as *Feltia* spp. Also, Stanley and Bennett (1965), in reporting on the seasonal abundance of 13 species of moths in Tennessee, state that *F. ducens* and *F. subgothica* are difficult to separate and since their occurrence is similar they are reported as one species.

The most common species in this complex was *F. jaculifera.* The first *jaculifera* was taken during the week of Aug. 17 (Fig.

3), and its numbers then increased rapidly until activity was at its height on Sept. 7. No more specimens were trapped after Sept. 22.

About two weeks after *jaculifera* appeared, the first *F. subgothica* was caught. Thereafter, flight activity increased until Sept. 14, and then declined until the last specimens were taken during the week ending Sept. 29 (Fig. 3).

Only 20 specimens of *F. herilis* were trapped. These were distributed in such a manner as to form an almost symmetrical curve (Fig. 3) having its beginning on Aug. 31, peak on Sept. 7, and ending on Sept. 14.

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## LITERATURE CITED

ANONYMOUS. 1966. Blacklight trap standards for general insect surveys. *Coop. Econ. Insect Rep.* 16:297.

BALES, B. R. 1909. A partial list of the Lepidoptera of Pickaway County, Ohio. *Ent. News* 20:169-77.

BANERJEE, A. C. 1967. Flight activity of the sexes of crambid moths as indicated by light-trap catches. *J. Econ. Ent.* 60:383-90.

DONAHUE, J. P. and J. H. NEWMAN. 1966. The genus Phragmatobia in North America, with the description of a new species (Lepidoptera: Arctiidae). *Michigan Entomologist* 1:35-74.

DYAR, H. G. 1891. On the specific distinctness of *Halisidota harrisii,* with notes on the preparatory stages of the species of *Halisidota* inhabiting New York. *Psyche* 6:162-6.

FORBES, W. T. M. 1948. Lepidoptera of New York and neighboring states. Part 2. Geometridae. Sphingidae. Notodontidae. Lymantriidae. Cornell Univ. (New York) Agr. Exp. Sta., Ithaca. Memoir 274. 263pp.

———. 1960. Lepidoptera of New York and neighboring states. Part 4. Agaristidae through Nymphalidae including butterflies. Cornell Univ. (New York) Agr. Exp. Sta., Ithaca. Memoir 371. 188pp.

FRANCLEMONT, J. G. 1946. A revision of the species of *Symmerista* Hubner known to occur north of the Mexican border (Lepidoptera, Notodontidae). *Can. Ent.* 78:96-103.

GROTE, A. R. 1882. New check list of North American moths. New York, N.Y. Ent. Club, 73pp.

HENNINGER, W. F. 1910. The Macro-Lepidoptera of Seneca County, Ohio. *Ohio Naturalist.* 11:233-42.

KIMBALL, C. P. 1965. Lepidoptera of Florida. Fla. Dept. of Agr., Gainesville, Fla. Vol. 1. 363pp.

PILATE, G. R. 1882. List of Lepidoptera taken in and around Dayton, Ohio. Papilio. 2:65-71.

SELMAN, C. L., and H. E. BARTON. 1972. Seasonal trends in catches of moths of twelve harmful species in black-light traps in Northeast Arkansas. *J. Econ. Ent.* 65:1018-21.

STANLEY, W. W., and S. E. BENNETT. 1965. Seasonal abundance of 13 species of moths caught in light traps in Tennessee. *Jour. Tenn. Acad. Sci.* 40:118-31.

TIETZ, H. M. 1952. The Lepidoptera of Pennsylvania. A manual. Penn. State Univ., State College, Pa. 194pp.

TURNER, W. B. 1920. Lepidoptera at light traps. *Jour. Agr. Res.* 18: 475-81.

WALSH, B. D. 1864. On phytophagic varieties and phytophagic species. *Proc. Ent. Soc. Phil.* 3:403-30.